

## Foreword

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National  
Oceanic and  
Atmospheric  
Administration



U.S.  
DEPARTMENT  
OF  
COMMERCE

# NOAA Fisheries Service Northeast Cooperative Research Partners Program

The National Marine Fisheries Service (NOAA Fisheries Service), Northeast Cooperative Research Partners Program (NCRPP) was initiated in 1999. The goals of this program are to enhance the data upon which fishery management decisions are made as well as to improve communication and collaboration among commercial fishery participants, scientists and fishery managers. NOAA Fisheries Service works in close collaboration with the New England Fishery Management Council's Research Steering Committee to set research priorities to meet management information needs.

Fishery management is, by nature, a multiple year endeavor which requires a time series of fishery dependent and independent information. Additionally, there are needs for immediate short-term biological, oceanographic, social, economic and habitat information to help resolve fishery management issues. Thus, the program established two avenues to pursue cooperative research through longer and short-term projects. First, short-term research projects are funded annually through competitive contracts. Second, three longer-term collaborative research projects were developed. These projects include: 1) a pilot study fleet (fishery dependent data); 2) a pilot industry based survey (fishery independent data); and 3) groundfish tagging (stock structure, movements and mixing, and biological data).

First, a number of short-term research projects have been developed to work primarily on commercial fishing gear modifications, improve selectivity of catch on directed species, reduce bycatch, and study habitat reactions to mobile and fixed fishing gear.

Second, two cooperative research fleets have been established to collect detailed fishery dependent and independent information from commercial fishing vessels. The original concept, developed by the Canadians, referred to these as "sentinel fleets". In the New England groundfish setting it is more appropriate to consider two industry research fleets. A pilot industry-based survey fleet (fishery independent) and a pilot commercial study fleet (fishery dependent) have been developed.

Additionally, extensive tagging programs are being conducted on a number of groundfish species to collect information on migrations and movements of fish, identify localized or subregional stocks, and collect biological and demographic information on these species.

For further information on the Cooperative Research Partners Programs please contact:

National Marine Fisheries Service (NOAA Fisheries Service)  
Northeast Cooperative Research Partners Program

(978) 281-9276 – Northeast Regional Office of Cooperative Research  
(401) 782-3323 – Northeast Fisheries Science Center, Cooperative Research Office, Narragansett  
Laboratory

[www.nero.noaa.gov/StateFedOff/coopresearch/](http://www.nero.noaa.gov/StateFedOff/coopresearch/)

## 1. Summary

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**Objectives:** We surveyed the Nantucket Lightship Area and the northern portion of Closed Area II as a base-line data set so that it will be possible to determine if the epibenthic community was significantly affected by the rotational fishing planned in Amendment 10. We also focused on data analysis, habitat classification, and mapping issues of the SMAST video data base extending from 1999 to 2003. This involved re-examining the video data and completing further classification and measurements.

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**Methodology:** We conducted two video surveys, one in the Nantucket Lightship Area and the second surveying the northern portion of Closed Area II. The sampling procedure for these surveys was a multistage design with stations separated by 0.85 nautical miles, similar to the 1999-2002 SMAST surveys. These surveys produced a series of maps of the sea floor in open and closed areas of Georges Bank detailing the distribution of substrate, depth, live scallops, dead scallops, and macroinvertebrates (sponges, starfish, filamentous fauna). We also focused on data analysis, habitat classification, and mapping issues of the SMAST video data base extending from 1999 to 2003. This component included the publication of the 2003 video survey, coordination with the NMFS SARC and NEFMC scallop and habitat PDT's, completion of the largest BACI environmental impact experiment and development of a Georges Bank-Mid-Atlantic species key based on video survey.

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**Results:** Address the four questions raised in the original proposal:

1. Has the HAPC on the Northern portion of Closed Area II reached a climax benthic community for Georges Bank?

Sea scallops are the dominant macroinvertebrate, and probably a keystone species in that this species has a major influence upon community structure, and are still increasing in density and in individual size.

2. Has this area reached its carrying capacity for scallops, which are the dominant macroinvertebrate in this community?

As sea scallop densities are still increasing it would appear that this population has not reached its carrying capacity, which is amazing as the density of 1.17 scallop m<sup>-2</sup> over an area of 396 km<sup>2</sup> is extremely high, surpassing any other recorded densities (Stokesbury et al 2004).

3. Is this dynamic environment influenced by stochastic events (such as storms) and thus continually disturbed? If so does it exhibit the structural properties we might expect based on our concepts of equilibrium and community succession?

We found that in both BACI experiments the fluctuations in number of categories and individuals within each category in the impact areas were similar to those in the control areas as well as fluctuations observed between years when fishing did not occur. The epibenthic community associated with sea scallop aggregations appears to be adapted to living in a dynamic environment as the sediment composition varied more than the benthic community structure.

4. This area has been closed since 1994, is there any evidence of species assemblages shifting over time and community succession?

It appears that in all the closed areas the epibenthic community is still shifting. In some cases, such as the northern portion of Closed Area II this results from the continuing increase in sea scallop abundance. In others such as the southern portion of Closed Area II shifts are occurring as the result of increasing predator densities (Stokesbury et al 2004), while in the Nantucket Lightship Area the scallops may be reaching such an old age that natural mortality is surpassing growth and recruitment. It appears that the sea scallop is the key species that influences much of the distribution and density of the other epibenthic invertebrates however further work needs to be completed for this hypothesis to be tested. Finally the epibenthic community in these areas was well adapted to a dynamic environment where the sediment composition shifts more drastically than the community structure associated with it.